

CLAIMS

- 1 1. A watch face with selective backgrounds comprising:
- 2 a polarizer layer for polarizing light passing therethrough;
- 3 a liquid crystal display disposed beneath the polarizer layer wherein the
- 4 liquid crystal display selectively rotates or does not rotate polarized
- 5 light;
- 6 a reflective polarizer layer located beneath the liquid crystal display and
- 7 positioned in a first orientation relative to said polarizer layer, wherein
- 8 rotated light reflects off the reflective polarizer layer producing a first
- 9 background on the watch face and non-rotated light is transmitted
- 10 through the reflective polarizer layer; and
- 11 a reflective layer disposed beneath the reflective polarizer layer wherein
- 12 the light passed through the reflective polarizer layer reflects off the
- 13 reflective layer producing a second background on the watch face.
- 1 2. The watch face of claim 1 wherein the polarizer layer comprises a neutral
- 2 polarizer.
- 1 3. The watch face of claim 1 wherein the polarizer layer comprises a colored
- 2 polarizer.
- 1 4. The watch face of claim 1 wherein the liquid crystal display is a twisted nematic
- 2 liquid crystal display.
- 1 5. The watch face of claim 1 wherein the liquid crystal display is an electronically
- 2 controlled birefringence liquid crystal display.
- 1 6. The watch face of claim 1 wherein the reflective polarizer layer is positioned in a
- 2 second orientation relative to said polarizer layer, wherein non-rotated light reflects off
- 3 the reflective polarizer layer producing the first background on the watch face and rotated
- 4 light is transmitted through the reflective polarizer layer.

- 1 7. The watch face of claim 1 wherein the reflective layer is a patterned surface.
- 1 8. The watch face of claim 1 wherein the reflective layer is a colored surface.
- 1 9. The watch face of claim 7 wherein the reflective layer is a colored surface.
- 1 10. The watch face of claim 1 wherein the reflective layer is a mirrored surface.
- 1 11. The watch face of claim 7 wherein the patterned surface is an analog clock face.
- 1 12. The watch face of claim 1 wherein the first and second background are colored.
- 1 13. The watch face of claim 1 wherein the first background is a first color and the
2 second background is a second color.
- 1 14. The watch face of claim 1 wherein the first background is a silvered mirror.
- 1 15. The watch face of claim 1 further comprising a color changing layer disposed
2 directly above or directly below the liquid crystal display.
- 1 16. The watch face of claim 15 wherein the coloring layer changing comprises a
2 colored polarizer.
- 1 17. The watch face of claim 15 wherein the color changing layer comprises a
2 retardation film.
- 1 18. The watch face of claim 1 wherein said watch face includes a hole extending
2 axially therethrough to provide for movement of analog time watch hands.
- 1 19. The watch face of claim 1 wherein said watch face is disposed within a watch
2 module.
- 1 20. The watch module of claim 20 wherein said module is round and said watch face
2 is octagonal.

1 21. The watch face of claim 1 further comprising voltage switching means, wherein
2 said switching means controls a voltage applied to said liquid crystal display.

1 22. The watch face of claim 22 wherein said voltage switching means is electronically
2 actuated.

1 23. The watch face of claim 22 wherein said voltage switching means is manually
2 actuated.

1 24. The watch face of claim 22 wherein said voltage switching means alternates
2 between a first and a second voltage.

1 25. The watch face of claim 24 wherein said first voltage produces the first
2 background and said second voltage produces the second background.

1 26. The watch face of claim 25 further comprising means for adjusting said second
2 voltage.

1 27. The watch face of claim 27 where in means for adjusting is electronically
2 actuated.

1 28. The watch face of claim 27 where in means for adjusting is manually actuated.
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- 1 29. A watch face with selective backgrounds comprising:
- 2 a polarizer layer for polarizing light passing therethrough;
- 3 a liquid crystal display disposed beneath the polarizer layer wherein the
- 4 liquid crystal display is divided into a plurality of distinct segments,
- 5 wherein each segment selectively rotates or does not rotate polarized
- 6 light;
- 7 a reflective polarizer layer located beneath the liquid crystal display and
- 8 positioned in a first orientation relative to said polarizer layer, wherein
- 9 rotated light reflects off the reflective polarizer layer producing a first
- 10 background on the watch face and non-rotated light is transmitted
- 11 through the reflective polarizer layer; and
- 12 a reflective layer disposed beneath the reflective polarizer layer wherein
- 13 the light passed through the reflective polarizer layer reflects off the
- 14 reflective layer producing a second background on the watch face.
- 1 30. The watch face of claim 29 wherein said plurality of distinct segments comprise a
- 2 digital time display.
- 1 31. The watch face of claim 29 wherein the polarizer layer comprises a neutral
- 2 polarizer.
- 1 32. The watch face of claim 29 wherein the polarizer layer comprises a colored
- 2 polarizer.
- 1 33. The watch face of claim 29 wherein the liquid crystal display is a twisted nematic
- 2 liquid crystal display.
- 1 34. The watch face of claim 29 wherein the liquid crystal display is an electronically
- 2 controlled birefringence liquid crystal display.

1 35. The watch face of claim 29 wherein the reflective polarizer layer is positioned in a
2 second orientation relative to said polarizer layer, wherein non-rotated light reflects off
3 the reflective polarizer layer producing the first background on the watch face and rotated
4 light is transmitted through the reflective polarizer layer.

1 36. The watch face of claim 29 wherein the reflective layer is a patterned surface.

1 37. The watch face of claim 29 wherein the reflective layer is a colored surface.

1 38. The watch face of claim 29 wherein the reflective layer is a colored surface.

1 39. The watch face of claim 29 wherein the reflective layer is a mirrored surface.

1 40. The watch face of claim 36 wherein the patterned surface is an analog clock face.

1 41. The watch face of claim 29 wherein the first and second background are colored.

1 42. The watch face of claim 29 wherein the first background is a first color and the
2 second background is a second color.

1 43. The watch face of claim 29 wherein the first background is a silvered mirror.

1 44. The watch face of claim 29 further comprising a color changing layer disposed
2 directly above or directly below the liquid crystal display.

1 45. The watch face of claim 44 wherein the color changing layer comprises a colored
2 polarizer.

1 46. The watch face of claim 44 wherein the color changing layer comprises a
2 retardation film.

1 47. The watch face of claim 29 wherein the watch face facilitates analog or digital
2 time display.

1 48. The watch face of claim 29 wherein the watch face includes a hole extending
2 axially therethrough to provide for analog time movement of watch hands.

1 49. The watch face of claim 29 wherein the watch face is disposed within a watch
2 module.

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1 50. The watch module of claim 29 wherein said module is round and said watch face
2 is octagonal.

1 51. The watch face of claim 29 further comprising a voltage switching means,
2 wherein said voltage switching means controls a voltage selectively applied to at least
3 one of a plurality of segment patterns, wherein each pattern is comprised of at least one
4 of the plurality of distinct segments.

1 52. The watch face of claim 51 wherein said voltage switching means alternates the
2 voltage between a first voltage and a second voltage.

1 53. The watch face of claim 52 wherein said first voltage causes each distinct
2 segment in the at least one of said plurality of segment patterns to rotate polarized light
3 and said second voltage causes each distinct segment in the at least one of said plurality
4 of segment patterns to not rotate polarized light.

1 54. The watch face of claim 51 wherein said voltage switching means is electronically
2 actuated.

1 55. The watch face of claim 51 wherein said voltage switching means is manually
2 actuated.

1 56. The watch face of claim 52 further comprising means for adjusting said second
2 voltage.

1 57. The watch face of claim 56 where in means for adjusting is electronically
2 actuated.

1 58. The watch face of claim 56 where in means for adjusting is manually actuated.

1 59. The watch face of claim 51 further comprising a pattern selection means, wherein
2 said selecting means controls the selection of at least one of the plurality of patterns.

1 60. The watch face of claim 59 wherein said pattern selection means is electronically
2 actuated.

1 61. The watch face of claim 59 wherein said pattern selection means is manually
2 actuated.

1 62. A watch face with selective backgrounds comprising:

2 a polarizer layer for polarizing light passing therethrough;

3 a first liquid crystal display disposed beneath the polarizer layer wherein

4 the first liquid crystal display is divided into a plurality of distinct

5 segments, wherein each segment selectively rotates or does not rotate

6 polarized light;

7 a second liquid crystal display disposed beneath the first liquid crystal

8 display, wherein the second liquid crystal display selectively rotates or

9 does not rotate polarized light;

10 a reflective polarizer layer located beneath the second liquid crystal

11 display and positioned in a first orientation relative to said polarizer

12 layer, wherein rotated light reflects off the reflective polarizer layer

13 producing a first background on the watch face and non-rotated light is

14 transmitted through the reflective polarizer layer; and

15 a reflective layer disposed beneath the reflective polarizer layer wherein

16 the light passed through the reflective polarizer layer reflects off the

17 reflective layer producing a second background on the watch face.

1 63. The watch face of claim 62 wherein said plurality of distinct segments in the first

2 liquid crystal display comprise a digital time display.

1 64. The watch face of claim 62 wherein the polarizer layer comprises a neutral

2 polarizer.

1 65. The watch face of claim 62 wherein the polarizer layer comprises a colored

2 polarizer.

1 66. The watch face of claim 62 wherein the liquid crystal displays are twisted nematic

2 type liquid crystal displays.

1 67. The watch face of claim 62 wherein the liquid crystal displays are electronically
2 controlled birefringence liquid crystal displays.

1 68. The watch face of claim 62 wherein the reflective polarizer layer is positioned in a
2 second orientation relative to said polarizer layer, wherein non-rotated light reflects off
3 the reflective polarizer layer producing a first background on the watch face and rotated
4 light is transmitted through the reflective polarizer layer.

1 69. The watch face of claim 62 wherein the reflective layer is a patterned surface.

1 70. The watch face of claim 62 wherein the reflective layer is a colored surface.

1 71. The watch face of claim 69 wherein the reflective layer is a colored surface.

1 72. The watch face of claim 62 wherein the reflective layer is a mirrored surface.

1 73. The watch face of claim 69 wherein the patterned surface is an analog clock face.

1 74. The watch face of claim 62 wherein the first and second background are colored.

1 75. The watch face of claim 62 wherein the first background is a first color and the
2 second background is a second color.

1 76. The watch face of claim 62 wherein the first background is a silvered mirror.

1 77. The watch face of claim 62 further comprising a color changing layer disposed
2 directly above or directly below either of the liquid crystal displays.

1 78. The watch face of claim 77 wherein the coloring lay changing comprises a
2 colored polarizer.

1 79. The watch face of claim 77 wherein the color changing layer comprises a
2 retardation film.

1 80. The watch face of claim 62 wherein said watch face includes a hole extending
2 axially therethrough to provide for movement of analog time watch hands.

1 81. The watch face of claim 62 wherein said watch face is disposed within a watch
2 module.

1 82. The watch module of claim 81 wherein said module is round and said watch face
2 is octagonal.

1 83. The watch face of claim 62 further comprising voltage switching means, wherein
2 said switching means controls a primary voltage selectively applied to at least one of a
3 plurality of segment patterns, wherein each pattern is comprised of at least one of the
4 plurality of distinct segments in the first liquid crystal display, and a secondary voltage
5 applied to said second liquid crystal display.

1 84. The watch face of claim 83 wherein said voltage switching means is electronically
2 actuated.

1 85. The watch face of claim 83 wherein said voltage switching means is manually
2 actuated.

1 86. The watch face of claim 83 wherein said voltage switching means alternates the
2 primary voltage between a first and a second voltage, and the secondary voltage between
3 a third and a fourth voltage.

1 87. The watch face of claim 86 wherein said first voltage causes each distinct
2 segment in the at least one of said plurality segment patterns to rotate polarized light and
3 said second voltage causes each distinct segment in the at least one of said plurality
4 segment patterns to not rotate polarized light, and wherein said third voltage causes the
5 second liquid display to rotate polarized light and said fourth voltage causes the second
6 liquid display to not rotate polarized light.

1 88. The watch face of claim 86 wherein said third voltage produces the first
2 background and said fourth voltage produces the second background.

1 89. The watch face of claim 86 further comprising means for adjusting said primary
2 and secondary voltages.

1 90. The watch face of claim 89 wherein means for adjusting is electronically
2 actuated.

1 91. The watch face of claim 89 wherein means for adjusting is manually actuated.

1 92. The watch face of claim 83 further comprising a pattern selection means, wherein
2 said selection means controls and selects the at least one of said plurality of segment
3 patterns.

1 93. The watch face of claim 92 wherein said pattern selection means is electronically
2 actuated.

1 94. The watch face of claim 92 wherein said pattern selection means is manually
2 actuated.

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1 95. A watch face with selective backgrounds comprising:
2 a polarizer layer for polarizing light passing therethrough;
3 a first liquid crystal display disposed beneath the polarizer layer wherein
4 the first liquid crystal display selectively rotates or does not rotate
5 polarized light;
6 a second liquid crystal display disposed beneath the first liquid crystal
7 display, wherein the second liquid crystal display is divided into a
8 plurality of distinct segments, wherein each segment selectively rotates
9 or does not rotate polarized light;
10 a reflective polarizer layer located beneath the second liquid crystal
11 display and positioned in a first orientation relative to said polarizer
12 layer, wherein rotated light reflects off the reflective polarizer layer
13 producing a first background on the watch face and non-rotated light is
14 transmitted through the reflective polarizer layer; and
15 a reflective layer disposed beneath the reflective polarizer layer wherein
16 the light passed through the reflective polarizer layer reflects off the
17 reflective layer producing a second background on the watch face.

1 96. The watch face of claim 95 wherein said plurality of distinct segments in the
2 second liquid crystal display comprise a digital time display.

1 97. The watch face of claim 95 wherein the polarizer layer comprises a neutral
2 polarizer.

1 98. The watch face of claim 95 wherein the polarizer layer comprises a colored
2 polarizer.

1 99. The watch face of claim 95 wherein the liquid crystal displays are twisted nematic
2 type liquid crystal displays.

1 100. The watch face of claim 95 wherein the liquid crystal displays are electronically
2 controlled birefringence liquid crystal displays.

1 101. The watch face of claim 95 wherein the reflective polarizer layer is positioned in a
2 second orientation relative to said polarizer layer, wherein non-rotated light reflects off
3 the reflective polarizer layer producing a first background on the watch face and rotated
4 light is transmitted through the reflective polarizer layer.

1 102. The watch face of claim 95 wherein the reflective layer is a patterned surface.

1 103. The watch face of claim 95 wherein the reflective layer is a colored surface.

1 104. The watch face of claim 95 wherein the reflective layer is a mirrored surface.

1 105. The watch face of claim 95 wherein the reflective layer is a mirrored surface.

1 106. The watch face of claim 102 wherein the patterned surface is an analog clock
2 face.

1 107. The watch face of claim 95 wherein the first and second background are colored.

1 108. The watch face of claim 95 wherein the first background is a first color and the
2 second background is a second color.

1 109. The watch face of claim 95 wherein the first background is a silvered mirror.

1 110. The watch face of claim 95 further comprising a color changing layer disposed
2 directly above or directly below either of the liquid crystal displays.

1 111. The watch face of claim 110 wherein the coloring lay changing comprises a
2 colored polarizer.

1 112. The watch face of claim 110 wherein the color changing layer comprises a
2 retardation film.

1 113. The watch face of claim 95 wherein said watch face includes a hole extending
2 axially therethrough to provide for movement of analog time watch hands.

1 114. The watch face of claim 95 wherein said watch face is disposed within a watch
2 module.

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1 115. The watch module of claim 114 wherein said module is round and said watch face
2 is octagonal.

1 116. The watch face of claim 95 further comprising voltage switching means, wherein
2 said switching means controls a primary voltage selectively applied to at least one of a
3 plurality of segment patterns, wherein each pattern is comprised of at least one of the
4 plurality of distinct segments in the second liquid crystal display, and a secondary voltage
5 applied to said first liquid crystal display.

1 117. The watch face of claim 116 wherein said voltage switching means is
2 electronically actuated.

1 118. The watch face of claim 116 wherein said voltage switching means is manually
2 actuated.

1 119. The watch face of claim 116 wherein said voltage switching means alternates the
2 primary voltage between a first and a second voltage, and the secondary voltage between
3 a third and a fourth voltage.

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1 120. The watch face of claim 119 wherein said first voltage causes each distinct
2 segment in the at least one of said plurality segment patterns to rotate polarized light and
3 said second voltage causes each distinct segment in the at least one of said plurality
4 segment patterns to not rotate polarized light, and wherein said third voltage causes the
5 second liquid display to rotate polarized light and said fourth voltage causes the second
6 liquid display to not rotate polarized light.

1 121. The watch face of claim 119 wherein said third voltage produces the first
2 background and said fourth voltage produces the second background.

1 122. The watch face of claim 119 further comprising means for adjusting said primary
2 and secondary voltages.

1 123. The watch face of claim 122 where in means for adjusting is electronically
2 actuated.

1 124. The watch face of claim 122 wherein means for adjusting is manually actuated.

1 125. The watch face of claim 116 further comprising a pattern selection means,
2 wherein said selection means controls and selects the at least one of said plurality of
3 segment patterns.

1 126. The watch face of claim 125 wherein said pattern selection means is electronically
2 actuated.

1 127. The watch face of claim 125 wherein said pattern selection means is manually
2 actuated.

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1 128. A watch face with selective backgrounds comprising:

2 a polarizer layer for polarizing light passing therethrough;

3 a first liquid crystal display disposed beneath the polarizer layer wherein

4 the first liquid crystal display is divided into a first plurality of distinct

5 segments, wherein each segment selectively rotates or does not rotate

6 polarized light;

7 a second liquid crystal display disposed beneath the first liquid crystal

8 display, wherein the second liquid crystal display is divided into a

9 second plurality of distinct segments, wherein each segment

10 selectively rotates or does not rotate polarized light;

11 a reflective polarizer layer located beneath the second liquid crystal

12 display and positioned in a first orientation relative to said polarizer

13 layer, wherein rotated light reflects off the reflective polarizer layer

14 producing a first background on the watch face and non-rotated light is

15 transmitted through the reflective polarizer layer; and

16 a reflective layer disposed beneath the reflective polarizer layer wherein

17 the light passed through the reflective polarizer layer reflects off the

18 reflective layer producing a second background on the watch face.

1 129. The watch face of claim 128 wherein said first plurality of distinct segments in the

2 first liquid crystal display comprise a digital time display.

1 130. The watch face of claim 128 wherein said second plurality of distinct segments in

2 the second liquid crystal display comprise a digital time display.

1 131. The watch face of claim 128 wherein said first and second pluralities of distinct

2 segments in the first and second liquid crystal displays each comprise a digital time

3 display.

1 132. The watch face of claim 131 wherein said digital time displays complement one

2 another.

1 133. The watch face of claim 128 wherein said first plurality of distinct segments in the
2 first liquid crystal display comprise a digital character display.

1 134. The watch face of claim 133 wherein said first and second pluralities of distinct
2 segments in the first and second liquid crystal displays each comprise a digital character
3 display.

1 135. The watch face of claim 134 wherein said digital character displays complement
2 one another.

1 136. The watch face of claim 128 wherein the polarizer layer comprises a neutral
2 polarizer.

1 137. The watch face of claim 128 wherein the polarizer layer comprises a colored
2 polarizer.

1 138. The watch face of claim 128 wherein the liquid crystal display is a twisted
2 nematic liquid crystal display.

1 139. The watch face of claim 128 wherein the liquid crystal display is an electronically
2 controlled birefringence liquid crystal display.

1 140. The watch face of claim 128 wherein the reflective polarizer layer is positioned in
2 a second orientation relative to said polarizer layer, wherein non-rotated light reflects off
3 the reflective polarizer layer producing a first background on the watch face and rotated
4 light is transmitted through the reflective polarizer layer.

1 141. The watch face of claim 128 wherein the reflective layer is a patterned surface.

1 142. The watch face of claim 128 wherein the reflective layer is a colored surface.

1 143. The watch face of claim 128 wherein the reflective layer is a colored surface.

1 144. The watch face of claim 128 wherein the reflective layer is a mirrored surface.

1 145. The watch face of claim 128 wherein the patterned surface is an analog clock
2 face.

1 146. The watch face of claim 128 wherein the first and second background are colored.

1 147. The watch face of claim 128 wherein the first background is a first color and the
2 second background is a second color.

1 148. The watch face of claim 147 wherein the first background is a silvered mirror.

1 149. The watch face of claim 128 further comprising a color changing layer disposed
2 directly above the first liquid crystal display or directly below the second liquid crystal
3 display.

1 150. The watch face of claim 149 wherein the color changing layer comprises a
2 colored polarizer.

1 151. The watch face of claim 149 wherein the color changing layer comprises a
2 retardation film.

1 152. The watch face of claim 128 wherein the watch face facilitates analog or digital
2 time display.

1 153. The watch face of claim 128 wherein the watch face includes a hole extending
2 axially therethrough to provide for analog time movement of watch hands.

1 154. The watch face of claim 128 wherein the watch face is disposed within a watch
2 module.

1 155. The watch module of claim 154 wherein said module is round and said watch face
2 is octagonal.

1 156. The watch face of claim 128 further comprising voltage switching means, wherein
2 said switching means controls a primary voltage selectively applied to at least one of a
3 first plurality of segment patterns, wherein each pattern is comprised of at least one of the

4 plurality of distinct segments in the first liquid crystal display, and a secondary voltage
5 selectively applied to at least one of a second plurality of segment patterns, wherein each
6 pattern is comprised of at least one of the plurality of distinct segments in the second
7 liquid crystal display.

1 157. The watch face of claim 156 wherein said voltage switching means is
2 electronically actuated.

1 158. The watch face of claim 156 wherein said voltage switching means is manually
2 actuated.

1 159. The watch face of claim 156 wherein said voltage switching means alternates the
2 primary voltage between a first and a second voltage, and the secondary voltage between
3 a third and a fourth voltage.

1 160. The watch face of claim 159 wherein said first voltage causes each distinct
2 segment in the at least one of said first plurality of segment patterns to rotate polarized
3 light and said second voltage causes each distinct segment in the at least one of said
4 second plurality of segment patterns to not rotate polarized light, and wherein said third
5 voltage causes the each distinct segment in the at least one of said second plurality of
6 segment patterns to rotate polarized light and said fourth voltage causes each distinct
7 segment in the at least one of said fourth plurality of segment patterns to not rotate
8 polarized light.

1 161. The watch face of claim 159 wherein said third voltage produces the first
2 background and said fourth voltage produces the second background.

1 162. The watch face of claim 159 further comprising means for adjusting said primary
2 and secondary voltages.

1 163. The watch face of claim 162 where in means for adjusting is electronically
2 actuated.

1 164. The watch face of claim 162 wherein means for adjusting is manually actuated.

1 165. The watch face of claim 156 further comprising a pattern selection means, wherein
2 said selection means controls and selects the at least one of each said pluralities of
3 segment patterns.

1 166. The watch face of claim 165 wherein said pattern selection means is electronically
2 actuated.

1 167. The watch face of claim 165 wherein said pattern selection means is manually
2 actuated.

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- 1 168. The watch comprising:
- 2 a watch case comprising within a display unit and two batteries, wherein
- 3 said batteries are positioned alongside said unit.
- 1 169. The watch of claim 168, further comprising an analog watch movement.
- 1 170. The watch of claim 168, wherein said display unit comprises a printed circuit
2 board and a liquid crystal display.
- 1 171. The watch of claim 170, further comprising an analog watch movement.
- 1 172. The watch of claim 168, wherein said batteries are 1.5 volt silver oxide batteries.
- 1 173. The watch of claim 168 wherein said display unit includes a hole extending
2 axially therethrough to provide for movement of analog time watch hands.